REMARKS

Claims 1-45 are pending in the above identified application. The Examiner has considered claims 6-24, 31-33, and 35-45 to be withdrawn. Claim 1 has been amended, while claims 46-54 have been added. Claims 1-5, 25, 27-30, and 34 have been rejected in the present office action. Claim 26 has been objected to. Applicants hereby traverse these rejections and submit that the amended claims overcome the Examiner's rejections.

Election/Restrictions

The Examiner states that claims 6-24, 31-33, and 35-39 are drawn to a non-elected species and has withdrawn those claims. Applicants disagree with the Examiner's analysis. In particular, claims 35-38 are drawn to particular properties of a barrier layer and therefore specifically read on the Species shown in Figure 1C. Therefore, Applicants request that claims 35-38 not be withdrawn in this application. Furthermore, Applicants remind the Examiner that once a generic claim such as claim 1 is allowed, the previously withdrawn claims should be re-entered into the application.

Claim Rejections Under 35 U.S.C. 103(a)

The Examiner rejected claims 1-4, 25, and 34 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,683,244 to Fujimori et al. ("Fujimori"). The Examiner also rejected claims 1, 2, 5 ,and 34 under 35 U.S.C. 103(a) as unpatentable over U.S. Application No. 10/101,863 to Zhang, et al. ("Zhang"). The Examiner further rejected claims 1, 2, 28-30, and 34 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application No. 09/820,079 to Kloster et al. ("Kloster"). Finally, the Examiner rejected claims 1, 2, 27, 28, 30, and 34 under

U.S.C. 103(a) as being unpatentable over U.S. Patent Application No. 10/316,088 to Chen et al. ("Chen"). Applicants hereby traverse these rejections.

In making a rejection under 35 U.S.C. § 103(a), the Examiner must establish the three elements of a *prima facie* case of obviousness. MPEP § 2142. First, the Examiner must show that the prior art references teach all elements of the claims. Second, the Examiner must show that the prior art provides the reason or motivation to make the claimed combination. The mere fact that references can be combined does not create a *prima facie* case of obviousness. Moreover, the motivation to combine cannot come from the applicant's own disclosure but must come from the prior art itself. Additionally, no motivation to combine references exists where doing so would render one of the prior art references unsatisfactory for its intended purpose. Third , the Examiner must prove that there is a reasonable expectation of success in combining the prior art references.

In this case, however, the cited references fail to teach all of the elements of amended claim 1 or new independent claim 48. Specifically, none of the references teach a dielectric layer "a soft-metal at the interface between the densified amorphous dielectric layer and the substrate, wherein the strain between the densified amorphous dielectric layer and the substrate is reduced by the soft-metal," as recited in amended claim 1 or "wherein a water vapor transmission rate through the barrier layer is less than about 1 X 10^{-2} $gm/m^2/day$," as is recited in new independent claim 48.

Claims 1-4, 25, and 34

The Examiner has rejected claims 1-4, 25, and 34 under 35 U.S.C. § 103(a) as being unpatentable over Fujimori (U.S. Patent No. 6,683,244). However, Fujimori fails to teach "a

soft-metal at the interface between the densified amorphous dielectric layer and the substrate, wherein the strain between the densified amorphous dielectric layer and the substrate is reduced by the soft-metal," as is recited in claim 1.

Fujimori teaches a "photoelectric conversion element." *See* Fujimori, col. 6, line 11. The photoelectric conversion element taught by Fujimori contains one electrode in contact with an electron transport layer, a barrier layer, and a second electrode in contact with a hole transport layer. *See* Fujimori, col. 6, lines 28-38. According to Fujimori:

> The barrier layer can be formed, for example, by the sol-gel method, evaporation (vacuum evaporation) method, sputtering method . . . spray thermal decomposition method, jet molding (plasma spraying) method, CVD method or the like.

Fujimori, col. 13, lines 48-53. Additionally, Fujimori teaches that a MOD method is preferred making "it possible to easily and reliably obtain a barrier layer having a dense structure, that is having a desired porosity." Fujimori, col. 2, lines 40-44. Fujimori does not teach "a soft-metal at the interface between the densified amorphous dielectric layer and the substrate, wherein the strain between the densified amorphous dielectric layer and the substrate is reduced by the soft-metal," as is recited in claim 1. Applicants, therefore, respectfully request that the Examiner withdraw this rejection.

Claims 1, 2, 5, and 34

The Examiner has rejected claims 1, 2, 5, and 34 under 35 U.S.C. § 103(a) as being unpatentable over Zhang et al. Zhang does not teach "a soft-metal at the interface between the densified amorphous dielectric layer and the substrate, wherein the strain between the densified amorphous dielectric layer and the substrate is reduced by the soft-metal," as is recited in claim 1.

Zhang teaches an invention that relates "to deposition of oxide and oxynitride films by pulsed DC reactive sputtering." *See* Zhang, page 1, par. 0002. According to Zhang, the apparatus performs "pulsed reactive DC magnetron sputtering" in which "the polarity of the power supplied to target 12 by power supply 14 oscillates between negative and positive potentials." *See* Zhang, page 3, par. 0053. Also, "[b]y applying a RF bias on wafer 16 during deposition, . . . the columnar structure can be substantially eliminated." *See* Zhang, page 3, par. 0057. The pulsed DC reactive sputtering, however, will inherently create a strain between the barrier layer and the substrate. Zhang, however, does not teach "a soft-metal at the interface between the densified amorphous dielectric layer and the substrate, wherein the strain between the densified amorphous dielectric layer and the substrate is reduced by the soft-metal," as is recited in claim 1.

Therefore, Zhang does not teach "a soft-metal at the interface between the densified amorphous dielectric layer and the substrate, wherein the strain between the densified amorphous dielectric layer and the substrate is reduced by the soft-metal," as is recited in claim 1. Claim 1 is therefore allowable over Zhang. Claims 2-4, 25, and 34 depend from claim 1 and are therefore allowable over Zhang for at least the same reasons as is claim 1. Applicants, therefore, respectfully request that the Examiner withdraw this rejection.

Claims 1, 2, 28-30, and 40

The Examiner has rejected claims 1, 2, 28-30, and 40 under 35 U.S.C. § 103(a) as being unpatentable over Kloster et al. (U.S. Publication No. 2002/0140103). However, Kloster failes to teach "a soft-metal at the interface between the densified amorphous dielectric layer and the

substrate, wherein the strain between the densified amorphous dielectric layer and the substrate is reduced by the soft-metal," as is recited in claim 1.

Kloster teaches "a microelectronic device and a structure therein that includes a diffusion barrier layer . . . [and] an etch stop layer." *See* Kloster, Abstract. Kloster teaches that a barrier layer may be formed by

> chemical vapor deposition (CVD), plasma-enhanced CVD (PECVD), low pressure CVD (LPCVD), or plasma-enhanced LPCVD (PELPCVD). . . . by physical vapor deposition (PVD) including reactive sputtering and radio-frequency (RF) sputtering, . . . by atomic layer deposition (ALD). Additionally, the carbon nitride layer may be formed by a post-deposition process of a C:H film with a nitrogen-containing compound . . . . The post deposition process may be an anneal, a rapid thermal process (RTP) as is known in the art, a plasma treatment as is known in the art, or combinations thereof.

See Kloster, page 2, block 0027. Kloster does not discloses "a soft-metal at the interface between the densified amorphous dielectric layer and the substrate, wherein the strain between the densified amorphous dielectric layer and the substrate is reduced by the soft-metal," as is recited in claim 1. Therefore, claim 1 is allowable over Kloster. Claims 2, 28-30, and 34 depend from claim 1 and are allowable over Kloster for at least the same reasons. Applicants, therefore, respectfully request that the Examiner withdraw this rejection.

Claims 1, 2, 27, 28, 30, and 34

The Examiner has rejected claims 1, 2, 27, 28, 30, and 34 under 35 U.S.C. § 103(a) as being unpatentable over Chen et al. (U.S. Application No. 2003/0178637). However, again Chen fails to teach "a soft-metal at the interface between the densified amorphous dielectric layer and the substrate, wherein the strain between the densified amorphous dielectric layer and the substrate is reduced by the soft-metal," as is recited in claim 1.

Chen describes "a method for integrating a compound semiconductor with a substrate of high thermal conductivity." *See* Chen, block 0002. As stated in Chen:

> A barrier layer is optionally formed on the wetting layer. The barrier layer serves the purpose of preventing the internal diffusion of the material of subsequent bonding layer to the wetting layer or the substrate. The barrier layer includes a material selected from a group consisting of molybdenum (Mo), platinum (Pt), tungsten (W), indium oxide, tin oxide, indium tin oxide, zinc oxide, and magnesium oxide.

See Chen, block 0025. Then, "a second bonding layer is formed on the barrier layer." *See* Chen, page 2, block 0025. Chen, however, fails to describe any properties of the barrier layer, the wetting layer, and the second bonding layer. Specifically, Chen fails to describe "a soft-metal at the interface between the densified amorphous dielectric layer and the substrate, wherein the strain between the densified amorphous dielectric layer and the substrate is reduced by the soft-metal," as is recited in claim 1. Claim 1 is therefore allowable over Chen. Claims 2, 27, 28, 30, and 34 depend from claim 1 and are therefore allowable over Chen for at least the same reasons as is claim 1. Applicants, therefore, respectfully request that the Examiner withdraw this rejection.

New Claims 48-54

New independent 48 recites "wherein a water vapor transmission rate through the barrier layer is less than about 1 X 10^{-2} gm/m^2/day." None of the references cited by the Examiner teach a barrier layer where the water vapor transmission rate through the barrier layer is less than about 1 X 10^{-2} gm/m^2/day. Therefore, claim 48 is allowable over the cited prior art. Claims 49-53 depend from claim 48 and are allowable for at least the same reasons as is claim 48.

Allowable Subject Matter

The Examiner objected to claim 26 as being dependent on a rejected claim. The Examiner noted that dependent claim 26 would be allowable if written in independent form to include all limitations of the base claim and any intervening claims. Claim 26, however, depends from amended claim 1. As discussed above, however, the base claim and any intervening claims are allowable. Therefore, claim 26 is allowable as written and has not been amended. Accordingly, Applicants respectfully request that the Examiner withdraw this objection.

Conclusion

In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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GARRETT & DUNNER, L.L.P.

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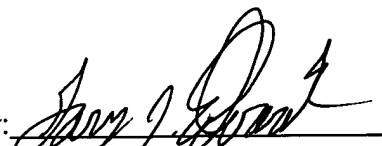
By: 
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